DOCUMENT RESUME

ED 277 581 SE 047 683

AUTHOR Adams, Harold S.; Lipford, Michael L.
TITLE The Great Smoky Mountains National Park: Its Use as a Natural Laboratory for General Biology.
PUB DATE [87]
NOTE 7p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Biology; Camping; *College Science; Ecology; Environmental Education; *Experiential Learning; Field Instruction; Field Studies; *Field Trips; Group Dynamics; Higher Education; Outdoor Education; Physical Education; Science Education; *Science Instruction
IDENTIFIERS *Environmental Education Programs; *Great Smoky Mountains National Park

ABSTRACT

Extended field trips have the potential to provide students with direct experience in learning about the natural world, as well as opportunities for the development of group cohesiveness. This document describes a program developed by a community college in which general biology students spend 3 days in the Great Smoky Mountains National Park. The program is intended to: (1) afford students the opportunity to study in the non-walled laboratory of the outdoors; (2) allow students to obtain, by direct experience, a better understanding of a natural environment that has been minimally disturbed by humans; (3) exemplify biological principles learned throughout the course, from the cell to the ecosystem; and (4) meet the needs of students in a non-traditional manner. In addition to the opportunity to learn biology in an experiential way, students were offerred the option of credit in hiking and backpacking, since the outdoor skills associated with such activities were taught as well. Two different trips are described, including pre-trip and post-trip activities, and the benefits of this type of field-based instruction are discussed. (TW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED277581

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Harold S. Adams
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The Great Smoky Mountains National Park: Its Use as a Natural Laboratory for General Biology

By

Harold S. Adams and
Michael L. Lipford
Dabney S. Lancaster Community College

OBJECTIVES

As an integral part of a year of biological study, we have used the Great Smoky Mountains National Park to:

(1) afford students the opportunity to study in the "non-walled" laboratory of outdoors, where variables are not controllable and resulting complexities are experienced directly,

(2) obtain, by direct observation, a better understanding and appreciation of a natural environment which has been disturbed minimally by man,

(3) exemplify biological principles learned throughout the course, from the cell to the ecosystem level of organization,

(4) meet the needs of students in an non-traditional manner. Additionally, we offer students the option of credit in Hiking and Backpacking, a physical education course, since the activities are oriented so strongly toward development of outdoor skills.

The Great Smoky Mountains National Park, TN and NC, comprises the largest wilderness area in the eastern United States and is designated as an International Biosphere Reserve. There are sixteen peaks over 6000 feet in the Smokies which are occupied by Canadian-like, spruce-fir forest; other, generally lower peaks, support natural meadows and shrub balds which are endemic only to the southern Appalachians. This montane expanse receives

SE 047 083

the greatest amount of rainfall in the United States (except for the Pacific Northwest) and, in certain areas, is classified as a temperate rain forest. A countless number of streams supports the most diverse deciduous forest of any global temperate zone excluding China. The park protects the largest remnant of undisturbed southern Appalachian forest where many world record size trees survived logging practices around the turn of the century. A continuum of plant communities is found, ranging from dry, pine-dominated stands to moist, cove hardwood stands along the moisture gradient; and from deciduous oak-hickory forests to coniferous spruce-fir forests along the elevational gradient. The heterogeneity of topography and vegetation has resulted in a wide variety of animal habitats. This diversity of plant and animal life make the park an unsurpassed natural laboratory for studying environmental processes.

METHODOLOGIES

Originally, the Smokies trip was integrated into our general biology program as a spring trip for a large group in which activities were performed away from an established base camp. Preparatory activities included outdoor physical, as well as academic activities. The former was accomplished by a moderately strenuous seven-mile hike to give the student a taste of mountain hiking and its physical demands. It also was a useful tool to assess the potential a student had for enduring three days of hiking. Readings and videotapes on outdoor information for hiking, camping, clothing, and food were reviewed and a pre-trip quiz given on this material. In addition, the student was prepared academically by studying scientific

papers describing plant communities to be visited and types of wildlife that may be encountered.

Activities performed on the spring trip began by establishing camp. Tasks were organized by designated tent groups and included unloading, tent set-up, food preparation, and clean up. The first real introduction to the Smokies occurred at Cades Cove where wildlife is abundant and can be observed with relative ease. Remnant homes of displaced mountain people are maintained at Cades Cove, and the student could gain an understanding of the lifestyle of these rugged people before establishment of the park. Here also aquatic sampling on two different mountain streams was performed for comparison of physical, chemical, and biotic components of running water communities. The next two days were spent hiking the mountains. Trails were chosen from experience to allow students the opportunity to observe the effect of aspect (north, south, east, west) and elevation (2000-6600 feet) on populations of plants and animals. Data were collected on composition of forest communities ranging from young successional to virgin, mature stands at different aspects and elevations.

Post-trip activities centered around collation and analysis of aquatic and terrestrial data collections. For evaluative purposes, students were examined on concepts emphasized throughout the trip.

More recently, the Smokies experience was restricted to a smaller, more advanced group of students enrolled in honors biology. This fall trip was made at the beginning of the academic year, and was used as an introduction to biological concepts and the diversity of life by providing a rigorous yet rewarding wilderness experience. For the past two years we have led a five

day/four night backpacking trip into the Smokies backcountry. Pre-trip activities included a comprehensive introduction to backpacking techniques and equipment along with a preview to the Smokies similar to that described for our former trips. The focus of this trip was directed toward the advanced nature of these students, and began with a visit to the Uplands Field Research Laboratory in Gatlinburg where students interface with park scientists who are actively involved in research. They were introduced to studies concerned with several threats to the park environment, including air pollution, the balsam wooly aphid, the European wild boar, the rainbow trout, and people. Thought processes were initiated here and then were applied directly in the backcountry where we ascended in elevation through a wide variety of habitats and community types to the summit of one of the highest peaks in the park. Careful attention was given to differing plants and plant communities and obvious successional changes occurring in these communities. After the exhausting trip, we visited other localities enroute to our home institution: Mt. Mitchell, North Carolina, the highest peak in the east, and Mt. Rogers, Virginia, the highest mountain in Virginia, and Whitetop Mountain, Virginia which displays one of the largest grass balds in the east.

EVALUATION

Although both kinds of trips are useful and benefit the student, we feel the more recent fall trip backpacking type of experience with a smaller group of honors students is more effective for the time spent. On this trip, many stops can be made along the trail to demonstrate ecological

concepts firsthand; hence, more time can be spent in instruction than with a large group that must return each evening to a base camp miles away. We also feel that a fall trip is better than one in the spring because group cohesiveness and biological awareness are established early in the academic year and is beneficial to both instructor and student.

De-briefing and trip evaluation by students has illustrated the importance of the Smokies experience. Following are some comments provided on evaluation forms by students who participated in the most recent trips:

> "I felt close to everyone after spending six days together. If I hadn't gone, I wouldn't have the same enthusiasm for the course."
>
> "I learned that it takes everyone--working together--to successfully camp six days in the Smokies. I also learned that I was not as tough as I thought I was or needed--sometimes to depend on others."
>
> "The trip was great! One (if not the best) of the greatest times in my life."

It is easy to explain the biological importance of such a trip but the intangibles involved with this activity are often just as rewarding for our type of student. The vast majority of these students, coming from rural backgrounds, have never had the opportunity to see the world outside of our service area. This experience enhances their awareness of America not only geographically but culturally as well. This is the first experience for many away from home where they visit restaurants and museums, budget money, and are enlightened in ways impossible to adequately describe. Some, on the other hand, have never camped before this excursion; these individuals have never heard an owl hoot or a bobcat scream, nor have they had to protect their belongings from wild animals such as bears. We have seen students

change for the better after this trip and we feel this exposure is part of our mission in the community college system in producing better citizens and well-rounded people.

Several former students have cited this trip as the reason for pursuing careers in field biology. As one example, a former female student who had never camped before the Smokies trip has returned to this area after obtaining a bachelor's degree in sociology from James Madison University, and assumed the position of Director of the county Office on Youth. As a direct result of her Smokies experience, she is now an outdoor enthusiast and has incorporated camping, backpacking, and canoeing activities into her summer programs for area youth who have benefited tremendously from these experiences.

In summary, participation in this unique experience instills in the student not only knowledge of biology and wilderness, but also group cooperation and fellowship not available in other types of activities. Additionally, the personal accomplishment of surviving in the backcountry and being exposed to a world outside of our service area are important aspects that cannot be directly evaluated.